

measurement update equations incorporate new measurements into the estimates to obtain an improved or updated estimate.

[0028] The KF-based signal processor of the present invention introduces a mechanism that propagates a mass air flow estimate (x) based on a 3rd order model. The estimator propagates the estimate error covariance based on the model and how noise affects signal generation. The controller 18 processes the KF-based signal processor and controls other components of the system 10 in response to the smoothed signal.

[0029] An output-error model is used to develop an estimated airflow model and an estimated compressor command model. The output-error model is able to handle heavily corrupted measurements while maintaining a standard transfer function form. Although the output-error model is implemented in the described embodiment, it is appreciated that other linear modeling techniques can be used. The output-error model is an approximation of the sensor dynamics.

[0030] Referring now to Figures 3A-3C, open-loop response data is collected from the compressor mass flow sensor system. More particularly, a compressor command signal is generated and mass flow rate data points are collected from the mass flow sensor. The compressor command signal includes a single step increase. The exemplary compressor command signal of Figure 3A includes an increase from approximately 1000 RPM to approximately 8000 RPM. The measured air mass flow rate from mass flow sensor 16 is illustrated in Figure 3B. A model is generated based on a 3rd order curve-fit of the air mass flow rate